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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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08/062,738 05/14/93 STARK

E GKST292A

EXAMINER
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25M1/0722

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ART UNIT	PAPER NUMBER
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2505

16

DATE MAILED: 07/22/93

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☒ This application has been examined ☐ Responsive to communication filed on _____ ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), _____ days from the date of this letter.
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited by Examiner, PTO-892. | 2. <input type="checkbox"/> Notice re Patent Drawing, PTO-948. |
| 3. <input type="checkbox"/> Notice of Art Cited by Applicant, PTO-1449. | 4. <input type="checkbox"/> Notice of Informal Patent Application, Form PTO-152. |
| 5. <input type="checkbox"/> Information on How to Effect Drawing Changes, PTO-1474. | 6. <input type="checkbox"/> _____ |

Part II SUMMARY OF ACTION

1. ☒ Claims 1-15, 17-26 are pending in the application.

Of the above, claims _____ are withdrawn from consideration.

2. ☒ Claims 16, 27-32 have been cancelled.

3. ☒ Claims 11-19, 22-25 are allowed.

4. ☒ Claims 1-10, 20, 21, 26 are rejected.

5. ☐ Claims _____ are objected to.

6. ☐ Claims _____ are subject to restriction or election requirement.

7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable. ☐ not acceptable (see explanation or Notice re Patent Drawing, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____ has (have) been ☐ approved by the examiner. ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed on _____, has been ☐ approved. ☐ disapproved (see explanation).

12. ☐ Acknowledgment is made of the claim for priority under U.S.C. 119. The certified copy has ☐ been received ☐ not been received
☐ been filed in parent application, serial no. _____; filed on _____

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

Claims 1-5 and 7 are rejected under 35 U.S.C. § 112, first and second paragraphs, as the claimed invention is not described in such full, clear, concise and exact terms as to enable any person skilled in the art to make and use the same, and/or for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims have been amended to include the limitation that the paths through the sample are "independent". This is unclear, confusing, and it appears that there is no disclosure to support such a limitation. The remarks filed 3 March 1993, in discussing this amendment, state that "Howarth does not provide independent paths of illumination either to or through the sample". If this is true, than neither does the disclosed invention. In the disclosed invention the different paths through the sample partially overlap; as can be seen in instant figure 1 the two different paths, while being separate at one end (11,12), are the same at the other end (15). Likewise, in Howarth (see figure 7 and column 4, line 63 through column 5, line 9 of that reference), the two light paths (source to 61, source to 62) through the sample (16) are separate at one end (61, 62) and are the same at the other end (source). The remarks filed 3 March 1993 defines this overlapping-at-one-end-and-separate-at-the-other-end relationship as being "along a single path, certainly not along independent paths" (page 11, lines 22-

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23). Since this is the same relationship as in the instant invention, by the same argument the instant invention does not provide "independent" light paths through the sample. Thus it is at least unclear what is meant by the term "independent" as inserted into the claims, and, to the degree the remarks are taken as correct, the amendment constitutes prohibited new matter in that there is no support for "independent paths" through the sample in the instant specification as filed.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same

person or subject to an obligation of assignment to the same person.

Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. § 102(b) as being anticipated by Howarth (US 3,994,602).

Howarth shows , in figure 7, providing illumination by way of a plurality (two) different paths through a specimen having a characteristic to be measured; the two paths are 1) from the source to window 61, and 2) from the source to window 62. These two paths are as "independent" as the paths through the sample in the arrangement disclosed in the instant specification; in both the two paths overlap at one end and are different at the other. Howarth senses a plurality of independent signals (the signal from D1 and the signal from D2) developed at the same time representing optical information obtained from the specimen, with each signal corresponding to a particular path. The signals are processed by a "modeling technique" which is appropriate for the desired measurement to minimize inaccuracies in the measured characteristic of the sample.

Claim 6 is rejected under 35 U.S.C. § 103 as being unpatentable over Howarth (US 3,994,602).

In figure 4, Howarth shows an angle between the illumination axis (through window 17) and the detector axis (through window 18). It would have been obvious to maintain this disclosed relationship in the embodiment of figure 7 of Howarth because it is a variant of the same invention that works by the same

principles and thus this arrangement would be expected to be as advantageous in that embodiment as in the embodiment of figure 4.

Claim 20 is rejected under 35 U.S.C. § 102(b) as being anticipated by Tachibana (JP 59-163545).

Tachibana shows a probe (see figure 5) with probe tip (the end of the probe at 29a, 29b, and 25), The probe provides illumination to a specimen (object 1) having a characteristic to be measured along a plurality of different paths at the probe tip (the paths 30-26-25-1 and 29-29a-1). There are means for sensing optical information (28) at a central aperture of the probe. There are means (32,36,37) for developing a plurality of independent signals corresponding the different paths. The information is processed with an appropriate modeling technique. The probe tip is place adjacent a specimen (1) of small size so that reflected energy from the specimen is directed to the central aperture of the probe.

Claims 1, 2, 7, 8, 20 and 21 are rejected under 35 U.S.C. § 102(b) as being anticipated by Borsboom (US 4,884,891).

Borsboom shows a probe which illuminates a sample; the sample can be translucent (see column 5, line 9) so the detected light will pass into and through the sample. Light is detected from two paths through the sample (path 3-4 and path 3-7). There are means to detect as plurality of signals (the detectors shown in figure 5, for example) representing the optical information

from the sample from along the two paths. The signals are processed (in section 20), such processing is appropriate. The probe 1 has a tip with a central aperture, and fiber optic elements (4,7) receive energy transmitted through the specimen to the central aperture.

Claims 3, 5, 9 and 10 are rejected under 35 U.S.C. § 103 as being unpatentable over Howarth (US 3,994,602) or Borsboom (US 4,884,891) in view of Venable (US 4,711,580) and Lebling et al. (US 4,583,858).

Both Howarth and Borsboom show the basic claimed arrangement, but neither shows directing the light long the different paths sequentially each with a different modulating characteristic. It is known in general in the art that light paths can be reversed and a light source and a plurality of detectors can be replaced by an equivalent arrangement of a detector and a plurality of light sources. This can be seen by a comparison of Venable, which shows a light source (102) and a plurality of detectors (fibers 103) at different angles and Lebling et al, which shows a plurality of light sources (fibers 10, 11,12) and a single detector (fiber 24), Because this is in general a well-known construction alternative, it would have been obvious to construct the arrangements of Howarth and Borsboom by replacing the light source with a detector and the detectors with light sources, driving the light sources on and off sequentially,

with a different modulation characteristic (phase) as does Lebling.

Claim 4 is rejected under 35 U.S.C. § 103 as being unpatentable over Howarth or Borsboom in view of Venable and Lebling et al. as applied to claim 2 above, and further in view of Badessa. It is known to separately detect light from a plurality of measurement paths with a single detector by modulating the light in the different measurement paths at different frequencies and using appropriate filters or the like to separate the signals from the detector; Badessa shows this. It would have been obvious at the time the invention was made to use this known technique to separate the two signals from the two measuring paths in the obvious arrangement of instant claim 2.

Claim 26 is rejected under 35 U.S.C. § 103 as being unpatentable over Venable (US 4,711,580) and Gerber (US 5,003,500) in view of Lebling et al. (US 4,583,858).

Venable shows the basic claimed arrangement with a central light source illuminating a sample and a plurality of fiber optic means receiving light from the sample at different angles and directing the light to detectors. Venable does not show the use of rings of detectors at the different angles although there are a plurality of detectors at each angle. It would have been obvious to use a ring, as shown by Gerber to detect the light because this would increase the light detected at each angle and

thus generate a stronger signal. Venable also does not show the details of the construction of the device; making the arrangement in the general shape of an elongated probe with a tubular element holding the elements, as in Lebling et al., would have been obvious because this is a known construction for such instruments.

Remarks

Claim 11, as amended, appears to be allowable over the art of record; the art does not appear to show the particular details of that claim. In particular the art does not show a probe with a tip having a plurality of rings having fiber bundles being disposed so that the applied and detected light travel through different paths through the specimen. Thus claims 11-15 and 17-19 are allowable. Claims 22-25 also appear to be allowable over the art of record; the art does not appear to show such a probe used in the manner claimed with a light source or detector on the far side of the sample.

It is noted that Howarth does not teach "pure reflectance". The light in Howarth is directed into the sample and one point and detected after passage through the sample at a point remote from point of illumination.

Papers related to this application may be submitted to Group 2500 by facsimile transmission. Papers should be faxed to Group 2500 PTO Fax Center. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (15 November 1989). The PTO Fax Center numbers are (703) 308-3719, (703) 308-3720 and (703) 308-3721.

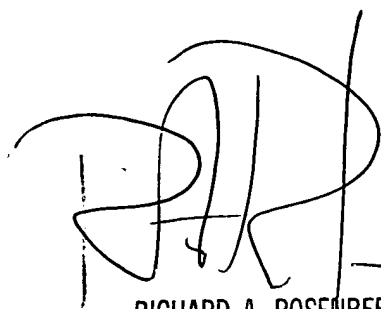
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to R. A. Rosenberger whose telephone number is (703) 308-4804.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956.

R. A. Rosenberger
20 July 1993



RICHARD A. ROSENBERGER
EXAMINER
ART UNIT 255